Innovative Projects

Summer 2019

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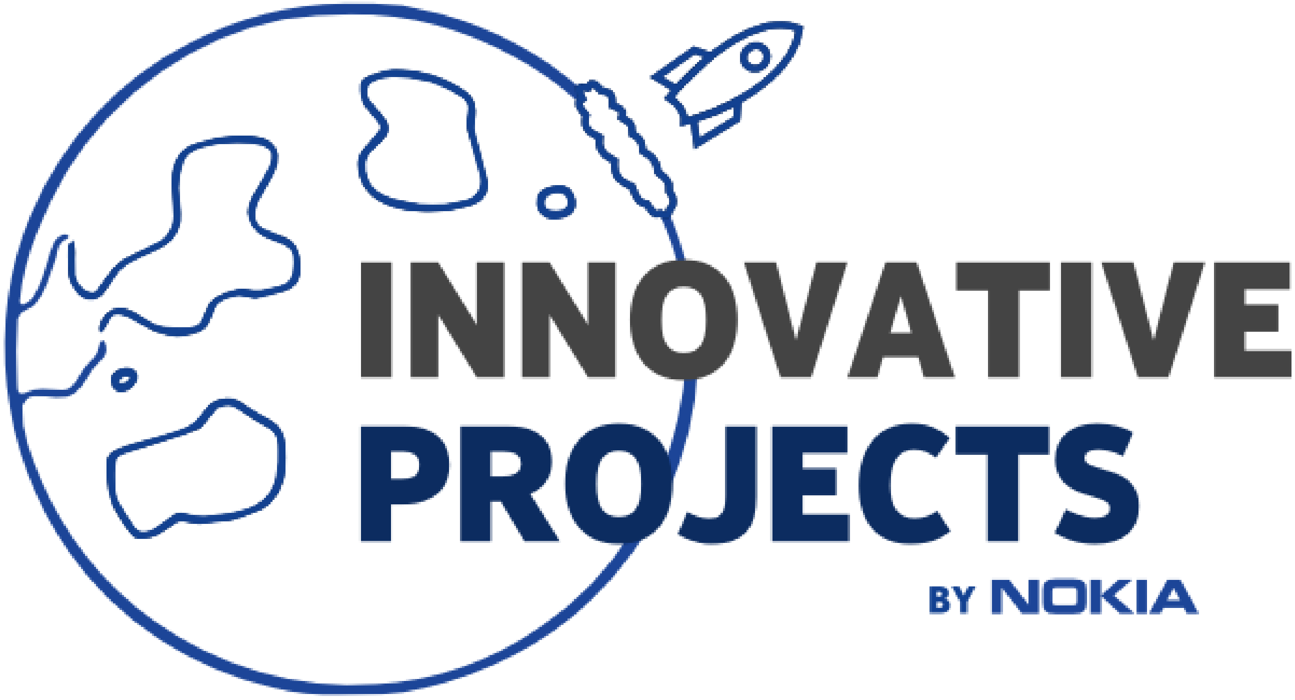

List of projects

#1	Inventory of supplies in Nokia Garage Makerspace
Project goals	Android + Web applications for inventory of tools and supplies in MakerSpace (part of Nokia Garage).
Scope definition	Scope: • Creating database system for makerspace inventory. • Creating web & Android app for searching inventory. • Adding, editing and removing inventory items in database by web app. • Automatic generation of barcode/QRcode for all inventory items. • Searching inventory in database by text and by scanned barcode/QRcode. • Listing all inventory with custom filters.
Requirements	• Basic knowledge about Web and Android development
Author	Ewelina Stolarczyk
Team size	3-4

#2	Employees Announcements
Project goals	Web application for managing internal employee announcements
Scope definition	Scope: • Sales management • Discussions stream • Found/lost/alert posts • Integration with current mailing system - send e-mail from web app in current stream with a specific template and then automatically post in a web app
Requirements	Basic programming knowledge
Author	Mariola Kowalska
Team size	4-6

#3	Squad Health Care App
Project goals	Health-check method, inspired by the Spotify, which our department has adopted to probe how teams are doing. Health-check is a clever way of measuring a team's feelings: once a month, team members are asked to rate their satisfaction with certain areas, such as 'Delivering value' or 'Teamwork'. The goal of this project is to simplify the whole process: collecting answers, reporting feedback to line manager, visualization of healthiness over time.
Scope definition	Create Web Application (frontend, backend, database) • Login and registration (support for LDAP) • Roles/groups management • Health Check form • Visualization layer
Requirements	• Interest in modern web development (JavaScript, React, Vue, Socket.IO) • Basic knowledge of DBMS • Docker
Author	Mateusz Sołtysik, Alicja Bielska
Team size	2-3

#4	Smart SMS
Project goals	Android application for parsing SMS and triggering defined actions.
Scope definition	Message parsing rules: • specific sender(s) • message content (key words or regular expression) Actions: • play sound • forward SMS • add additional notification • run another application
Requirements	Java and/or Kotlin, support for Android 6.0 or higher
Author	Krzysztof Zieliński
Team size	2-4

#5	Competitive teams management application
Project goals	The goal of the project is to create a sports team management application. The application should have a friendly UI that allows users to create and modify teams and members, manage tournaments and visualize gathered results and statistics. Additionally the project can be extended to include more advanced statistics methods to predicate and calculate best teams match-ups and line-ups. Project is dedicated to students interested in learning web development.
Scope definition	Example features: • Define a team and add team members • Create team members roles and assign them • Register matches between teams with various statistics (duration, results, no. of sets/matches, score etc.) • Manage tournaments between many teams with various rulesets • Calculate and aggregate team statistics • Basing on collected data predicate best team setup and win probability against other teams • Top/trending team/player ranking basing on different criteria
Requirements	JS + Backend technology (Python, NodeJS, GoLang etc.) + any DB
Author	Wojciech Adamek
Team size	3-4

#6	InnoPoint
Project goals	Application will be used to improve the organization process of Innovative Projects. It will improve the following aspects: • Call for topics – gathering project ideas before the new Innovative Projects edition • Project admissions – replacing the current decentralized, mail-based approach with a clean, transparent process • Project setup - through the integration of various APIs (Github, Trello, Slack) • Communication – on the mentor – team and mentor – academic contact layer (possibly by integrating the Google and/or Outlook Calendar) • Synchronization of all teams – for common events like presentation workshops and application demos • Project summary – optional grading and synchronization with the academic contact
Scope definition	• Login/registration process (integration with GitHub oAuth would be nice to have) • Different roles: student, team leader, mentor, academic contact, moderator • Mentor should for example be able to: – Submit project idea – Create a public profile – Assign himself to project – Create a repository for the project from application level (integration with GitHub API) • Moderator should for example be able to add projects, accept/reject project submissions and modify/remove teams • Student should for example be able to join a team, access project's view • Team leader should for example be able to invite students to a team, apply for projects • Academic contact for example should be able to assign to teams, request mentor feedback • Project's view should contain project description, overview, important links • Mentor's public profile should contain mentor's photo and biography • Team's view should contain for example list of pending request to join the team, current team members • Nice to have global surverys, calendar (integration with Google Calendar/Outlook) and activity breakdown based on GitHub repository statistics
Requirements	• Basic knowledge of web development (JavaScript, HTML, CSS, nice to have: React or Vue.js) • Basic knowledge of database operations • Basic knowledge of some backend technology (preffered one of: Node.js, Java, Scala) • Optional: some experience with mobile development (Android) • Only for Computer Science students (requires some experience in programmin)
Author	Patryk Kowalcze
Team size	4-6

#7	Video stream processing for an e-Health system
Project goals	Provide video stream processing functionalities, which enable touchless monitoring of the condition and behavior of individuals. Video monitoring is a part of a larger e-Health system where data streams from different types of sensors are processed and combined with data from other relevant sources (e.g. information about medical treatment). An important part of the video stream processing is anonymization functionality, which shall ensure privacy of the monitored individuals while keeping the information which is necessary to extract valuable insights via video analytics.
Scope definition	Main scope: • Capture video stream from a camera. • Transfer securely the video stream for a pre-processing by a video stream anonymizer. • Adding, editing and removing inventory items in database by web app. • Provide a video stream anonymization functionality. Use existing open source resources, like e.g. `https://github.com/facebookresearch/DensePose`, as far as feasible. • Transfer securely the anonymized video to the video analytics system. In case you are willing to go some extra miles you have different options: • Consider basing the processing on WWS (`https://www.worldwidestreams.io/`) - a stream processing platform created by Nokia Bell Labs. • Add video analytics functionalities like: – extraction of vital signs (e.g. pulse and respiration rates, body temperature). Use e.g. `https://github.com/Pwan101/pulsefromheadmotion`; – sleep quality monitoring; – sleep quality monitoring; – mood identification; – behavior anomaly detection. • Synchronize the video stream with data streams from other monitoring sources, like wearables (e.g. `https://www.imec-int.com/en/chill`, `https://www.imec-int.com/en/circuitry-sensor-hubs/disposable-health-patch`) and environmental sensors (e.g. light intensity and noise levels). • Evaluate the potential benefits of Edge Cloud processing, e.g. using Airframe Open Edge Server `https://networks.nokia.com/products/airframe-open-edge-server` • Consider usability of blockchain in ensuring the data security. Note that the project scope will be adjusted based on the team size and capabilities.
Requirements	• can-do attitude :) • willingness to learn new technologies and tools • experience with programming in Python and C++ • experience with Digital Signal Processing (especially video) will be an advantage, but is not mandatory
Author	Łukasz Skomra
Team size	3-4

#8	NB-IoT devices for an even Smarter City
Project goals	Create a prototype of an NB-IoT enabled device that tackles a need or a problem of citizens living in a city like Wrocław. Your prototype will be used as a part of an interactive NB-IoT technology demonstration in Nokia Garage. The final result can be far from an actual product, however it needs to work ;)
Scope definition	Main scope: • Look into Smart City use cases and choose a suitable candidate for an NB-IoT based solution. Some inspiration: https://networks.nokia.com/industries/smart-city, https://www.gsma.com/iot/smart-cities/ • Design a first prototype of your device, based on one of available NB-IoT enabled development platforms (e.g. mangOH, PyCom, Arduino). • Make, make, make: – o Use the NB-IoT modem in combination with sensors and/or actuators and whatever else you need. Note that you can start with a WiFi connectivity and introduce an NB-IoT connectivity afterwards. – o Iteratively improve your prototype. – o Use Nokia IMPACT IoT platform (https://networks.nokia.com/solutions/iot-platform) for a hustle-free data collection. In case you are willing to go some extra miles you have different options: • Design and print a custom cover for your device on a 3D printer. • Visualize the data from multiple devices (real and simulated). • Add data analytics to make sense of the sensor data. • Why stop with a prototype? Build a Minimum Viable Product and make your city smarter. Note that the project scope will be adjusted based on the team size and capabilities.
Requirements	• can-do attitude :) • willingness to learn new technologies and tools • experience with HW and embedded SW will be an advantage, but is not mandatory
Author	Łukasz Skomra
Team size	3-4

#9	Chatbot with Watson NLU / NLP
Project goals	The goal of the project is to create interface to available IBM Watson Assitance instance.
Scope definition	Deliver chatbot with below aspects fullfilled: • Backend - create communication interface (API) to IBM Watson. • Frontend - create dedicated simple GUI with possibility for human interaction with bot.
Requirements	• Web technologies knowledge • Spring framework (or willingness to learn it)
Author	Michał Pomykała
Team size	2-3

#10	Test engine for SPA application frontend
Project goals	Project and implementation of a test engine for dynamic SPA web applications. This solution should be as generic and scalable as possible in order to be maintainable by a team of developers, as well as allow for adding new tests without substantial growth in complexity.
Scope definition	This solution should: • Implement unit tests and end-to-end tests of SPA web application frontend written in Vue.js • Ensure coverage for all components • Ensure scalability • Be as generic as possible • Be relatively easy to explain to developers who are new to the project • Be compatible with other JS technologies
Requirements	• Basic knowledge of version control • Basic knowledge of Docker • Knowledge of modern javascript (ES6) and best practices • Knowledge of Vue.js framework • Knowledge of Cypress framework
Author	Wojciech Trela, Marcin Cichański
Team size	5

#11	Recognition of people using Maker Space in Nokia Garage
Project goals	The goal of the project is to create a prototype to recognize people who enter Maker Space in Nokia Garage.
Scope definition	Scope: • Recognition of people • Counting people • Face identification using ML algorithms (for example Tensorflow)
Requirements	• Machine learning • Python/Java • Frontend and Backend technologies
Author	Tomasz Michałowski
Team size	2-3

#12	Network Evolution Analysis
Project goals	Project is dedicated for students interested in data analysis. The main goal is to dive into our customer's data and extract information about gains obtained by migration to new version of software. It requires to combine data about operator's network configuration and its performance. Students have to face the three main fields which are essential in any Data Science projects: • Data Engineering • Data Analysis • Data Visualization
Scope definition	Scope: • Dataset preprocessing & validation • Detection of starting the migration process (based on network configuration data) • Estimation of gain obtained by software upgrade (based on network performance data) • Visualization of results
Requirements	• SQL • Python/R • Background in statistic is very welcome (especially time series analysis)
Author	Ewa Boryczka
Team size	2-3

#13	Code review notifications
Project goals	A cross-browser compatible extension built using WebExtension API for code review notifications. Usually version control systems have poor built in system to handle notifications about what is happening in the review where user is participant or owner of it. Some already developed integrations do not meet the development team expectations or just does not exist. Receiving mails as notification is the same uncomfortable as our version control system sens a lot of mails everyday. At some point it is going to be considered as spam and turned off.
Scope definition	The goal is to create a light solution for a browser (which is opened almost all the time) with rich but not disturbing notification system and check-in list to keep those review requests organized and always have them around. The extension is intended to work with GitHub and GitLab git-repository platforms.
Requirements	• Basic knowledge about JavaScript, HTML, and CSS for being able to write browser extensions. • Willingness to learn.
Author	Maciej Bakowicz
Team size	2-3

#14	Interactive Graph Visualization Tool
Project goals	The goal of this project is to create a tool for interactive playing with graph-structured data. User should have a possibility to upload own dataset for further filtering, visualization and graph comparison. Possibility to export results and playground session sharing will be a useful extension.
Scope definition	Scope: • Creating WebApp (frontend, backend, database) • Comparison of modern web visualization technologies (efficiency, scalability, memory usage) • Dataset management module (CRUD for uploading files) • Graph playground (interactive graph definition, comparison and results/session exporting)
Requirements	• Interest in modern web development (JavaScript, React, Vue, Socket.IO) • Basic knowledge of DBMS • Docker
Author	Alicja Figas
Team size	3-5

#15	Multiplayer Action race game
Project goals	Create a 2D multiplayer action game where players race through a platformer-style "city" map, trying to get on top of highest buildings and installing BTS-es/Antennas for their team. General rules/ideas: • A crossover between Icy Tower and Mirror's Edge 2D • Players try to climb up the highest points, but there are difficulties on the way that can cause them to fall down (see Getting Over It with Bennet Foddy) • Players can interrupt others / knock them down on the way • Possible game types: Race to the top, Capture the BTS, Install as many BTSes in a given time
Scope definition	Scope: • Multiplayer Game engine that allows players to move across a 2D side scroller map, interact with each others and complete objectives • Preferably the game should be runnable in browser • Optional: Map Editor
Requirements	• Basic knowledge about game development • Basic knowledge about transfering data over network (TCP/UDP) • Familiarity with some game frameworks e.q. Phaser.js, Unity is very welcome
Author	Michał Porzycki
Team size	2-4

#16	ML models management system
Project goals	The goal of this project is to create a tool for Data Scientists teams to support Machine Learning models management. Data Scientists create a lot of various models with different parameters in their machine learning project. There is a need to build a system which gives clear overview of trained models.
Scope definition	• Create a service with UI and authentication enabling to view uploaded machine learning models with time of training, metadata, dataset info • Quality of models • Create a client for connecting with service • Notifications about changes in project
Requirements	• Knowledge of Python and JavaScript (or other languages) • Basic knowledge of database management and file storage systems • Basic understanding of ETL/ML/CI processes • Interest in Web Applications development
Author	Cezary Depta
Team size	3-5